

WHAT IS CLAIMED IS:

1                    1.        A system for coupling a high intensity focused ultrasound transducer to  
2 a patient comprising:  
3                    a circuit for conveying a coupling fluid;  
4                    pump for circulating coupling fluid through the circuit;  
5                    a vacuum chamber connected to apply a pressure gradient to said circuit such  
6 that dissolved gasses are drawn out of said coupling fluid; and  
7                    a coupling reservoir connected to said circuit for coupling a transducer to a  
8 patient.

1                    2.        The system as described in claim 1 further comprising a chiller on said  
2 circuit for cooling said coupling fluid.

1                    3.        The system as described in claim 1, wherein said vacuum chamber  
2 comprises one or more gas permeable membranes through which gas may be drawn from said  
3 fluid.

1                    4.        The system as described in claim 1, wherein the pump is also  
2 connected to draw a vacuum in the vacuum chamber.

1                    5.        The system as described in claim 1, further comprising a control device  
2 for adjusting said circulation pump.

1                    6.        The system as described in claim 1, further comprising one or more  
2 sensors.

1                    7.        The system of claim 6, wherein said one or more sensors are in  
2 electronic communication with said control device.

1                    8.        The system as described in claim 6, wherein said sensor(s) capable of  
2 reporting information to an operator.

1                    9.        The system of claim 1, wherein said fluid is a coolant for controlling  
2 the temperature of a transducer.

1                    10.      The system of claim 1, further comprising a storage tank located on  
2 said circuit.

1                    11.     The system of claim 1, further comprising a means for reducing  
2     pressure and volume fluctuations.

1                    12.     The system as described in claim 1, having one or more valves in said  
2     circuit.

1                    13.     The system as described in claim 1, wherein said fluid is water.

1                    14.     An apparatus for performing high intensity focused ultrasound (HIFU)  
2     procedures, the apparatus comprising:

3                    a first housing having a high intensity focused ultrasound (HIFU) transducer;

4                    a second housing having system electronics for controlling said transducer, a  
5     user interface, a display and a power supply; and

6                    a system for circulating a degassed coupling fluid wherein said coupling fluid  
7     is circulated between said first housing and said second housing and said first housing and  
8     said second housing are in electronic communication.

1                    15.     The apparatus as described in claim 14, wherein said system for  
2     circulating a degassed coupling fluid further comprises one or more sensors in electronic  
3     communication with said system electronics, and said system electronics able to operate as a  
4     controller for said system for circulating a degassed coupling fluid.

1                    16.     The apparatus as described in claim 14, wherein the system for  
2     circulating a degassed coupling fluid is a cooling system for dissipating heat from said high  
3     intensity focused ultrasound (HIFU) transducer.

1                    17.     A method for performing ultrasound therapy, said method comprising:  
2                    applying an ultrasound transducer to a tissue surface of the patient;  
3                    energizing the transducer to emit ultrasonic energy to the patient;  
4                    circulating a coupling fluid to the transducer; and  
5                    applying a vacuum to the circulating coupling fluid to degas said fluid.